Unit 22

Marine Mammals of the Alaska Region

Introduction

The Alaska region has 35 stocks of at least 25 species of marine mammals. Three of these species (sea otter, polar bear, and walrus) are managed by the U.S. Fish and Wildlife Service, and the remaining cetaceans and pinnipeds are managed by NOAA Fisheries. According to the criteria provided in the 1994 Amendments to the Marine Mammal Protection Act (MMPA), these include 9 strategic stocks: the Northern fur seal (which is depleted under the MMPA); the sperm whale, the western North Pacific and central North Pacific humpback whales, the fin whale, the North Pacific right whale, and the bowhead whale (listed as endangered under the ESA); and both the western U.S. and eastern stocks of Steller sea lions (listed as threatened under the ESA). Of the 35 stocks, five are believed to be increasing, ten are stable, two are declining, and the population status of the remaining 18 are unknown.

Three stocks, the Gulf of Alaska harbor seal and the Norton Sound and Cook Inlet beluga whales, are subject to subsistence harvests. While most marine mammal stocks are assessed under the authority of Section 117 of the MMPA, NOAA Fisheries determined that management of the stocks subject to subsistence harvests that do not have significant commercial takes should be developed through the co-management process described in Section 119 of the Act. The process should also include a sound research and management program to identify and address uncertainties concerning the stocks. Therefore, the required estimates of PBR and "strategic" determinations have not been made at this time for these three stocks.

Marine mammal stock status in the Aleutian region is summarized in Table 22-1. Important population parameters for the stocks and their status under the various protected species laws are included. A narrative for some selected stocks follows:

Table 22-1. Status of Marine Mammal Stocks in the Alaska Region

Species	Stock Area	N_{MIN}[1]	PBR[2]	Total Annual Mortality	Strategic Status[3]	MMPA/ESA Status[4]	Trend[5]
Steller sea lion	Western U.S.	42,536	766	555	Y	T	D
Steller sea lion	Eastern	23,533	1,059	8	Y	T	I
Northern fur seal	North Pacific	969,595	20,846	1,783	Y	D	S
Harbor seal	S.E. Alaska	32,745	1,965	1643			
Harbor seal	Gulf of Alaska	N/D	N/D	868	N/D		S
Harbor seal	Bering Sea	17,243	1,035	334			D
Spotted sea	Alaska	N/A	N/A	N/A			S
Bearded seal	Alaska	N/A	N/A	N/A			U
Ringed seal	Alaska	N/A	N/A	N/A			U
Ribbon seal	Alaska	N/A	N/A	N/A			U
Beluga	Beaufort Sea	38,194	764	160			U
Beluga	E. Chukchi Sea	3,710	74	65			S
Beluga	Norton Sound	N/D	N/D	147	N/D		S
Beluga	Bristol Bay	1,526	31	22			U
Beluga	Cook Inlet	N/D	N/D	N/D	N/D		S
Killer whale	AK & WA Inland Transient	759	7.6	0.8			S
Killer whate	AK & WA Inland Resident	245	2.4	0.8			U
Pacific white-sided dolphin	North Pacific	486,719	4,867	1.1			U
Harbor porpoise	Alaska	24,635	246	33			U
Dall's porpoise	Alaska	76,874	1,537	41			U
Sperm whale	Alaska	N/A	N/A	N/A	Y	E	U
Baird's beaked whale	Alaska	N/A	N/A	0			U
Cuvier's beaked whale	Alaska	N/A	N/A	0			U
Stejnerger's beaked whale	Alaska	N/A	N/A	0			U
Gray whale	E. North Pacific	21,715	434	0.3			I
Humpback whale	W. North Pacific	N/A	N/A	0	Y	E	U
Humpback whale	Central North Pacific	1,407	2.8	0	Y	E	I
Fin whale	North Pacific	N/A	N/A	0	Y	E	U
Minke whale	Alaska	N/A	N/A	0			U
Northern right whale	North Pacific	N/A	0	0	Y	E	U
Bowhead whale	Western Arctic stock	7,524					
Sea otter	Alaska	100,000					
Polar bear	Alaska-Chukchi-Bering Sea	N/A					
Polar bear	Alaska-Chukchi-Bering Sea	1,579					
Walrus	Alaska	188,316					

[1] N_{MIN} = Minimum population is estimated as the lower 20th percentile of the log-normal distribution of the population estimate, which is equivalent to the lower limit of a 60% two-tailed confidence interval.
[2] PBR = Potential biological removal.
[3] Strategic status: Y = yes, N/A = information is not available and N/D = estimated value has not been determined at this time.
[4] MMPA/ESA status: E = listed as endangered and T = listed as threatened under the Endangered Species Act.
D = listed as depleted under the Marine Mammal Protection Act.
[5] Trend is increasing (I), stable (S), decreasing (D), and unknown (U).

Steller Sea Lion: Western and Eastern North Pacific U.S. Stocks

Stock Definition and Geographic Range

Steller sea lions range along the North Pacific rim from northern Japan to California, with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands, respectively. The species is not known to migrate, but individuals disperse widely outside of the breeding season (late May-early July), thus potentially intermixing with animals from other areas. Two separate stocks of Steller sea lions are recognized within U.S. waters: an eastern stock, which includes animals east of Cape Suckling, Alaska (144°W), and a western U.S.

stock, which includes animals at and west of Cape Suckling. Steller sea lions in Canada are considered part of the eastern stock.

Population Size

The most recent estimate of Steller sea lion abundance in Alaska is based on aerial surveys performed in June 1994 from southeast Alaska to the western Aleutian Islands. The surveys counted animals, excluding pups, at 95 'trend sites', where sea lions have been monitored since the 1970s. A few additional sites were also surveyed in 1994. Differences between aerial and ship-based survey counts of the same areas were used to develop correction factors. Using these correction factors, the 1994 surveys estimated 43,200 Steller sea lions (33,600 nonpups and 9,600 pups) for the entire Gulf of Alaska, Aleutian Islands, and Bering Sea region that comprises the western U.S. stock . The estimate for the eastern stock from the southeast Alaska, California, and Oregon region was 23,900 Steller sea lions (18,600 nonpups and 5,300 pups). Aerial surveys in British Columbia during 1994 estimated 13,846 animals.

Minimum Population Estimate

Using the population estimate (N) of 43,200 and an associated CV of 0.0184, N_{MIN} for the western U.S. stock is calculated as 42,536 (Table 22-1). Similarly, the population estimate for the eastern stocks of 23,900 and an associated CV of 0.0184 gives a minimum population estimate of 23,533 sea lions.

Current Population Trend

Western Stock—The first reported trend counts (an index of population size) of Steller sea lions in Alaska were made during 1956-60 which indicated that there were at least 140,000 sea lions in the Gulf of Alaska and Aleutian Islands. Subsequent surveys indicated a major population decrease, first detected in the eastern Aleutian Islands in the mid-1970s. The decline appeared to have spread eastward to the Kodiak Island area during the late-1970s and early-1980s, and then westward to the central and western Aleutian Islands during the early and mid-1980s. The greatest declines occurred in the eastern Aleutian Islands and western Gulf of Alaska, but declines also occurred in the central Gulf of Alaska and central Aleutian Islands. Uncorrected counts from 1976-79 indicated about 104,000 sea lions. The western stock decreased 37.4% from 1989 to 1994. The 1994 estimate was 42,536 animals (Table 22-1).

Eastern Stock—Trend counts for Steller sea lions of the eastern stock have been relatively stable at about 2,000-3,000 animals (Fig. 22-1). The counts in Oregon have shown a gradual increase since 1976, as the adult and juvenile count for that year was 1,486 compared to 3,522 for 1994. This increase is likely due to a recovery from reduced numbers caused by mortality prior to 1972, as immigration from other areas has not been documented. Counts in California declined by over 50% from 5,000-7,000 between 1927 and 1947 to 2,000-2,500 between 1980 and 1990; limited information suggests that counts in northern California have increased from the late-1970s to the early 1990s. At Ano Nuevo, California, a steady decline in ground counts started around 1970, resulting in a 85% reduction in the breeding population by 1987. Based on data from vertical photography taken between 1990 and 1993, pup numbers declined at a rate of 9.9%, while non-pups declined at a rate of 31.5%. Most recently, population estimates for Steller sea lions in the eastern stock increased 5.8% from 1989 (22,600) to 1994 (23,533).

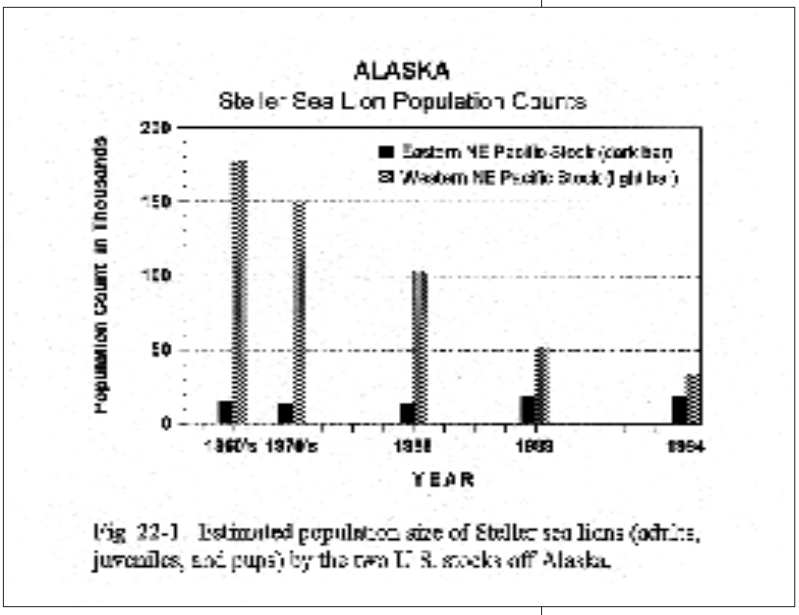

Fig. 22-1 Estimated population size of Steller sea lions (adults, juveniles, and pups) by the two U.S. stocks off Alaska.

Steller Sea Lion Counts
(Pups Excluded)

Year	W. North Pacific (U.S. Stock)	E. North Pacific (U.S. Stock)
1960s	117,000	15,000
1970s	149,000	13,000
1985	102,000	13,200
1989	51,500	17,600
1994	33,600	18,600

Status of Stock

The Potential Biological Removal (PBR) for the western U.S. stock of Steller sea lions has been estimated at 766 animals, and PBR for the eastern stock at 1,059. The estimated annual level of total human-caused mortality and serious injury was 555 animals for the western stock and 8 for the eastern stock. Neither of the mortalities exceed the PBRs for these stocks. Both stocks of Steller sea lion are currently listed as threatened under the ESA, but the western stock is under consideration for endangered status. Thus, both stocks of Steller sea lions are classified as strategic stocks. Management actions recently implemented to reduce interactions with human activities include no-entry buffer zones around rookeries, prohibition of groundfish trawling within 10-20 nautical miles of certain rookeries, and spatial and temporal allocation of Gulf of Alaska pollock catches.

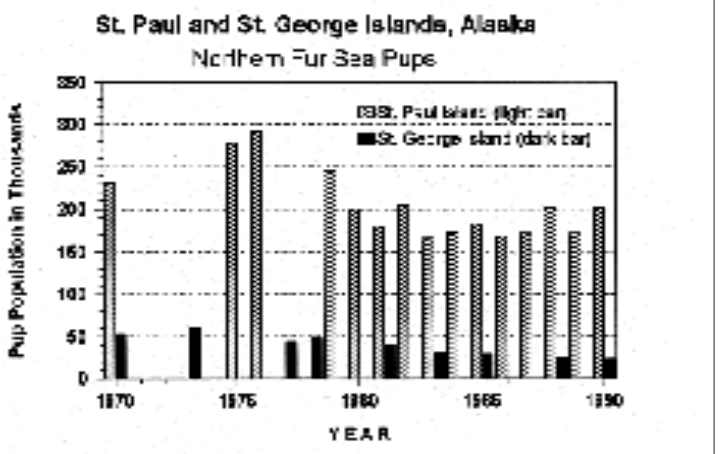

Fig. 22-2 Northern fur seal pup counts at St. Paul and St. George Islands, Alaska

Northern Fur Seal: Eastern Pacific Stock

Stock Definition and Geographic Range

Northern fur seals occur from southern California north to the Bering Sea and west to the Okhotsk Sea and Honshu Island, Japan. During the breeding season, approximately 74% of the worldwide population is found on the Pribilof Islands in the southern Bering Sea, with the remaining animals spread throughout the North Pacific. Of the seals in U.S. waters outside of the Pribilofs, approximately 1% of the population is found on Bogoslof Island in the southern Bering Sea and San Miguel Island off southern California. Fur seals may temporarily haul-out onto land at other sites in Alaska, British Columbia, and on islets along the coast of the continental United States, but generally outside of the breeding season.

Adults usually occur on shore during a 6-month period, principally during the reproductive season (June-November), then migrate south and spend the next 6 months at sea. Adult females and pups from the Pribilof Islands migrate through the Aleutian Islands into the North Pacific, often to the Oregon and California offshore waters. Pups may remain at sea for 22 months before returning to their rookery of birth. Adult males generally migrate only as far south as the Gulf of Alaska. Two separate stocks of northern fur seals are recognized within U.S. waters: an eastern Pacific stock, and a San Miguel Island stock.

Population Size

The population estimate for the eastern Pacific stock of fur seals is calculated as the estimated number of pups at rookeries multiplied by a series of different expansion factors determined from a life table analysis to estimate the number of yearlings, 2-yr olds, 3-yr olds, and animals at least 4-yrs old. The expansion factors are based on a sex and age distribution estimated after the harvest of juvenile males was terminated. The resulting population estimate is equal to the pup count multiplied by approximately 4.475. As the great majority of pups are born on the Pribilof Islands, pup estimates are concentrated on these islands, though additional counts are made on Bogoslof Island. A total population estimate for the northern Pacific stock based on these pup counts in 1994 was 1,019,192 seals.

Minimum Population Estimate

Using the population estimate (N) of 1,019,192 and an associated CV of 0.0593 for pup counts, N_{MIN} for the eastern Pacific stock of northern fur seals is 969,595 animals.

Current Population Trend

The Alaskan population of northern fur seals recovered to approximately 1.25 million animals in 1974, after the killing of females in the pelagic fur seal harvest was terminated in 1968. The population first began to decrease with pup production declining at a rate of 6.5-7.8% per year into the 1980s; the total stock estimate in 1983 was 877,000. Annual pup production on St. Paul Island has remained relatively stable since 1981 (Figure 22-2), indicating that stock size has not changed much in recent years. The most recent stock estimates prior to 1994 were 984,000 in 1992, and 1.01 million in 1990. The northern fur seal was designated as depleted under the MMPA in 1988 because population levels had declined to less than 50% of levels observed in the late-1950s and there was no compelling evidence that carrying capacity (K) had changed substantially since the late-1950s. Under the MMPA, this stock will remain listed as depleted until population levels reach at least the lower limit of it's Optimum Sustainable Population, OSP (60% of K).

Status of Stock

The PBR for the eastern Pacific stock of northern fur seals is 20,846 animals. The estimated annual level of total human-caused mortality and serious injury is 1,783 seals, which does not exceed its PBR. The eastern Pacific stock of the northern fur seal is classified as a strategic stock because it is designated as depleted under the MMPA.

Bowhead Whale: Western Arctic Stock

Stock Definition and Geographic Range

Bowhead whales are distributed in seasonally ice-covered waters of the Arctic and near-Arctic, generally north of 54°N and south of 75°N in the Western Arctic Basin. Small stocks occur in the Sea of Okhotsk, Davis Strait, Hudson Bay, and Spitsbergen, but only a few tens to a few hundreds are found in each of these stocks. The largest remnant population is the western Arctic stock which migrates from wintering areas (November to March) in the northern Bering Sea, through the Chukchi Sea in the spring (March through June), to the Beaufort Sea where they spend much of the summer (mid-May through September) before returning to the Bering Sea in the autumn (September through November). The bowhead spring migration follows fractures in the sea ice around the coast of Alaska, generally in the shear zone between the shorefast ice and the mobile polar pack ice. There is evidence of whales following each other, even when their route does not take advantage of large ice-free areas, such as polynya. As the whales travel east past Point Barrow, Alaska, their migration is somewhat funneled between the shoreline and the polar pack ice, making for an optimal location from which to study this stock. Most of the year, bowhead whales are closely associated with sea ice. Only during the summer is this population in relatively ice-free waters in the southern Beaufort Sea, an area often exposed to industrial activity related to petroleum exploration.

Population Size

All stocks of bowhead whales were severely depleted during intense commercial whaling prior to the 20th century, starting in the early-16th century near Labrador and spreading to the Bering Sea in the mid-19th century. Prior to commercial whaling, the minimum world wide population estimate was 50,000 animals, with 10,400-23,000 in the Western Arctic stock. This population dropped to less than 3,000 when commercial whaling on this stock ceased at the end of the 19th century (Fig. 22-3).

Since 1978, counts of bowhead whales have been conducted from sites on sea ice north of Point Barrow, during the whales' spring migration. These counts have been corrected for whales missed due to distance offshore (through acoustical locators), whales missed when no watch was in effect (based on sighting rates), and whales missed during a watch (estimated as a function of visibility, number of observers, and distance offshore). However, in some years a small proportion of the population may not migrate past Point Barrow in the spring, therefore the estimate could be negatively biased. In 1993, unusually good counting conditions resulted in what is considered to be the most accurate population estimate to date for this stock: 8,000 bowhead whales (CV = 0.0730), with a 95% confidence interval from 6,900 to 9,200.

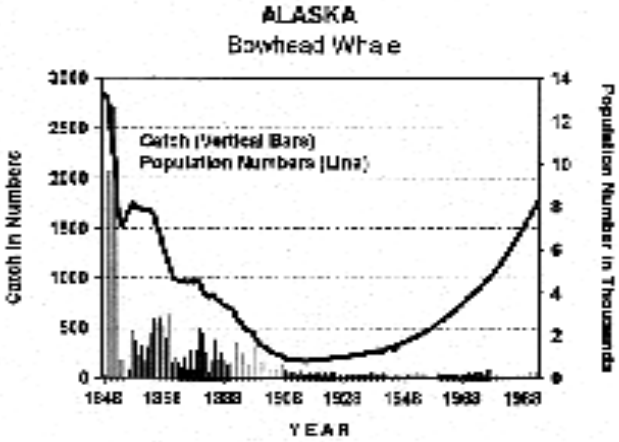

Fig. 22-9 Bowhead whale population trend and catch history

Bowhead Whale Population Numbers

1987	5,364
1988	6,579
1993	7,770

Minimum Population Estimate

Using the population estimate (N) of 8,000 and its associated CV of 0.073, N_{MIN} for the western Arctic stock of bowhead whales is 7,524.

Current Population Trend

The western Arctic stock increased at a rate of 3.1% (95% CI = 1.4-4.7%) from 1978 to 1993, when abundance increased from approximately 5,000 to 8,000 whales. This rate of increase takes into account whales that passed beyond the viewing range of the observers.

Status of Stock

The PBR for this stock is 75 whales. The International Whaling Commission (IWC) independently established a quota for the number of bowhead whales to be taken by subsistence hunters, such that the number of whales struck cannot exceed 68 in 1995, 67 in 1996, 66 in 1997, and 65 in 1998. The IWC determination takes precedence over the U.S. PBR estimate for the purpose of managing the Alaska native subsistence harvest. The level of human-caused mortality and serious injury averaged over the past five years (42) does not exceed the PBR (75) nor the IWC quota for 1995 (68). Bowhead whales of the western Arctic stock are listed as endangered under the ESA and further classified as a strategic stock.

Beluga Whale: Beaufort Sea, Eastern Chukchi Sea, Norton Sound, and Bristol Bay Stocks

Stock Definition and Geographic Range

Beluga whales are distributed throughout seasonally ice-covered arctic and subarctic waters of the Northern Hemisphere, and are closely associated with open leads and polynya in ice-covered regions. Depending on season and region, beluga whales in the western Arctic may occur in both offshore and coastal waters, with concentrations in Cook Inlet, Bristol Bay, Norton Sound, Kasegaluk Lagoon, and the Mackenzie Delta. It is assumed that most beluga whales from these summering areas overwinter in the Bering Sea. Seasonal distribution is affected by ice cover, tidal conditions, access to prey, temperature, and human interaction. During winter, beluga whales occur in offshore waters associated with pack ice. In the spring, they migrate to warmer coastal estuaries, bays, and rivers for molting and calving. Annual migrations may cover thousands of kilometers.

Five putative stocks of beluga whales are recognized within U.S. waters: Cook Inlet, Bristol Bay, Norton Sound, Eastern Chukchi Sea, and Beaufort Sea.

Population Size

The sources of information to estimate abundance of belugas have included both opportunistic and systematic observations. The most recent survey conducted in 1992 for the Beaufort Sea stock resulted in an estimate of approximately 20,805 whales. A correction factor of 2 has been recommended for the Beaufort Sea stock, resulting in a current population estimate of 41,610. The estimated minimum size of the Eastern Chukchi stock of belugas is 1,200 based on counts of animals from aerial surveys conducted during 1989-1991. If this count is corrected for the proportion of animals that were diving and thus not visible at the surface, and for the proportion of newborns and yearlings not observed due to small size and dark coloration, the total corrected estimate for the Eastern Chukchi Sea is 3,710. The 1994 population estimate for Bristol Bay is 1,555, and for Cook Inlet Sound is 1,251. There currently is no population estimate for the Norton Sound stock.

Minimum Population Estimate

The minimum population estimates for Alaska beluga whale stocks are: 38,194 for the Beaufort Sea stock; 3,710 for the eastern Chukchi sea stock; and 1,529 for the Bristol Bay stock. Minimum population estimates have yet to be estimated for Norton Sound and Cook Inlet beluga stocks.

Current Population Trend

The Beaufort Sea stock of beluga whales is believed to be stable or increasing; the eastern Chukchi Sea, Bristol Bay, and Cook Inlet stocks are believed to be stable. The population trend for the Norton Sound stock is uncertain at this time.

Status of Stock

The PBR for Alaska beluga stocks are: 764 for the Beaufort Sea stock; 74 for the Eastern Chukchi Sea stock; and 31 for the Bristol Bay stock. PBRs have not been estimated for the Norton Sound and Cook Inlet stocks at this time. The levels of human-caused mortality and serious injury for these stocks averaged over the past five years are: 160 for the Beaufort Sea stock; 65 for the Eastern Chukchi Sea stock; 147 for the Norton Sound stock; 22 for the Bristol Bay stock; and is unknown for the Cook inlet stock. At this time, none of the three Alaska beluga whale stocks have been classified as strategic stocks under the MMPA. ❑